AUGUST 10, 2007
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The Second Best Thing About Payday

nih record

ABOVE • *Teachers are needed by the science education program Adventure in Science. See story on p. 11.*

features

departments

Gateway Center Boasts Montgomery County's First Green Roof

By Belle Waring

Some plants need a patch of ground plumped up by the gardener's hand, while their hardier cousins bloom in the wilderness where rainfall is scanty and winters are rough. These toughies sprout in mountainous rock, which serves as a microclimate: shallow roots settle in cracks that trap precious water; stones bank heat that extend the growing season. For instance, "chicks & hens" and other succulents bloom in rocky soil with little moisture. With their affinity for rugged places, these beauties are welcome in eco-design; seven various patches now grace the NIH Gateway Center's new green roof.

"Chicks & hens" thrive in dry, rocky soil and beautify Gateway Center's green roof.

"The benefits are multipurpose and

SEE **ROOF,** PAGE 6

Testing the Future

STEP Forum Makes Robotic Medicine Come to Life

By Sarah Schmelling

It seemed more fantasy novel than symposium: a paralyzed woman moves a circle on a monitor using only her thoughts, a robot assists in surgery, a student practices an operation on a simulated person and medics-in-training treat soldiers in a virtual version of the streets of Baghdad.

"But this is not science fiction. This is happening," said Dr. John Donoghue, director of the Brain Science Program at Brown University, referring to just some of the technology described in a recent Staff Training in Extramural Programs forum here. Yet, his statement could be applied to all of the areas of research covered by the event titled, "Robotic Medicine: Dr. R2D2 Will See You Now."

We're at the beginning of a new age, Donoghue said. His area of interest, neural interface systems, is "something you're going to see grow immensely in the next decades…devices that interface with the nervous system and allow new ways of diagnosing and treating nervous

SEE **ROBOTS,** PAGE 4

Dr. Paul Mittelstadt races bikes in his spare time.

NCI's Mittelstadt Is Maryland Cycling Champion

By Rich McManus

The last two weekends in June were kind to Dr. Paul Mittelstadt, a cancer researcher in Bldg. 37 who races bikes in his spare time. On June 24, he won the 50+ race at the Reston Town Center Grand Prix. Six days later he won the Maryland state championship for his age group in a 50-mile road race in Smithsburg, Md., near Hagerstown. And on May 20, he won the Leonardtown Criterium.

SEE **CYCLIST,** PAGE 8

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NIH Record Office
Bldg. 31, Rm. 5B41
Phone (301) 496-2125
Fax (301) 402-1485

Web address
http://nihrecord.od.nih.gov

Editor
Richard McManus
rm26q@nih.gov

Assistant Editor
Carla Garnett
cg9s@nih.gov

Staff Writers
Jan Ehrman
je48b@nih.gov

Sarah Schmelling
ss1116y@nih.gov

Belle Waring
bw174w@nih.gov

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briefs

Transfusion Medicine Hosts Annual Symposium, Sept. 20

The Clinical Center's department of transfusion medicine, together with the national headquarters of the American Red Cross, will host the 26th annual symposium on immunohematology and blood transfusion on Thursday, Sept. 20 from 8:25 a.m. to 4:30 p.m. in Masur Auditorium, Bldg. 10.

Participants will learn how stem cells are used for cardiac repair; recognize transfusion transmissible agents; and review literature, protocols and practices to help make blood component therapy decisions. Dr. Paul Ness, director of transfusion medicine at Johns Hopkins Medical Institutions, will receive the 2007 Richard J. Davey lectureship award, which is given annually to an individual whose contributions have significantly advanced the field of transfusion medicine with outstanding achievements in research or clinical practice and commitment to education. CC staff participating in the program include Drs. Harvey Alter, Barbara Bryant, Cathy Cantilena, Harvey Klein, Susan Leitman, David Stroncek and Sumithira Vasu. For more information contact Karen Byrne at (301) 451-8645 or KByrne@cc.nih.gov.

BIG Bone Marrow Registry Drive Set, Aug. 30

The NIH chapter of Blacks In Government is partnering with the NIH Marrow Donor Program to recruit volunteers to join the National Bone Marrow Registry. A bone marrow registration drive will be held Thursday, Aug. 30 from noon to 1 p.m. in Lipsett Amphitheater, Bldg. 10. Attendees will hear testimony and have an opportunity to register. Marrow transplants are life-saving treatments for people with leukemia, lymphoma and many other diseases. The registry contains more than 10 million potential donors. Because tissue type is inherited, matches are most likely made with someone from a similar racial and ethnic background. BIG and the donor program are working to improve the registry's diversity. All are encouraged to stop by the drive. To learn more about marrow transplants, visit www.marrow.org. For details about the NIH event, call Earl Simmons at (301) 435-4365.

Principles of Clinical Pharmacology Course

The Principles of Clinical Pharmacology course, sponsored by the Clinical Center, will begin in Lipsett Amphitheater, Bldg. 10 on Sept. 6. The course will be held Thursday evenings from 6:30 to approximately 7:45 and will run through Apr. 24, 2008.

The course, now in its 10th year, covers topics such as pharmacokinetics, drug metabolism and transport, assessment of drug effects, drug therapy in special populations and drug discovery and development.

Registration is open to all interested individuals at no cost unless the course is being taken for graduate credit. The course may be taken for credit through the Foundation for Advanced Education in the Sciences as PHAR 500 I and PHAR 500 II; contact FAES directly at (301) 496-7976. Deadline for registration is Aug. 23. Certificates of participation will be awarded at the end to all students who attend 75 percent of the lectures. More information is available at www.cc.nih.gov/ccc/principles or by calling Donna Shields, (301) 435-6618.

NLM Launches New Exhibition: 'Medicine and Magic in Harry Potter'

A decade ago, British writer J.K. Rowling published *Harry Potter and the Philosopher's Stone*, the first in a series of seven books about a boy wizard who is the only known survivor of a "killing curse." A year later the book was released in the United States with the title *Harry Potter and the Sorcerer's Stone*. Rowling's books were soon breaking publishing records and "the boy who lived" became entrenched in the popular imagination.

But there is more to the Harry Potter series than a child hero or a fantasy adventure—many characters, plants and creatures are based in history, medicine and magical lore. Rowling has drawn on important works of alchemy and herbology in shaping her stories. In a special temporary exhibition, the National Library of Medicine's History of Medicine Division showcases seven of the beautiful, centuries-old treasures in its collection that are mentioned in *Harry Potter*.

The exhibit is open Monday through Friday, 8:30 a.m. to 5 p.m., through Nov. 30 in the History of Medicine Division reading room, first floor, Bldg. 38.

NLM will offer a free screening of the first movie in the Harry Potter series, *Harry Potter and the Sorcerer's Stone*, on Friday, Sept. 7, in Lister Hill Auditorium, Bldg. 38A. There will be light refreshments in the Lister Hill lobby at 5:30 p.m. and the program will begin at 6. All are welcome.

2008 COPR Nomination Process Opens

NIH is seeking applicants to fill vacancies on the 2008 Council of Public Representatives (COPR) roster. COPR advises the NIH director on cross-cutting issues related to medical research and health topics of public interest that ultimately promote individual, family and community well-being. The council consists of up to 21 individuals selected from among the diverse communities that benefit from and have an interest in NIH research, programs and activities. Applications are due Friday, Sept. 14.

For more information or to apply online, visit the COPR web site at copr.nih.gov/application.asp. To request an application by mail, phone (301) 650-8660 ext. 136, fax (301) 650-7172 or email COPR1@palladianpartners.com.

Capt. Peter Hartsock (l) joins TV fitness guru Jack LaLanne as a White House honoree.

NIDA's Hartsock Wins President's Medal

Capt. Peter Hartsock of NIDA recently won the inaugural Platinum Medal of the President's Council on Fitness and Sports for achievements exceeding what for half a century had been honored by a gold medal.

The President's Fitness Challenge was instituted in 1956 by President Dwight Eisenhower and has continued under all succeeding chief executives. For the last 50 years, the highest level of achievement recognized by the challenge was the Gold Medal. But it recently became clear that a few individuals exceeded the gold standard by a considerable margin. First among these overachievers is Hartsock, who received the first Platinum Medal.

At the council's observance of National Fitness Month in May, several "legends of fitness" were recognized for lifetime achievements. They included longtime television fitness guru Jack LaLanne and aerobics godfather Dr. Ken Cooper.

In addition to Hartsock's fitness achievements, he has also been a program official in NIDA's AIDS research since it was established in the 1980's. His focus has been on international aspects of the AIDS epidemic and quantitative modeling and has earned him Surgeon General's Exemplary Service Medals.

Hartsock says one of the reasons he works out daily is that he is the oldest active ocean lifeguard on the Delmarva coast. "You have to be in shape or you don't come back alive and you don't succeed in making a rescue," he said. He is on the national board of the U.S. Lifesaving Association, the British Royal Lifesaving Society and is a governor of the British Royal National Lifeboat Institution.

"I'm not a fitness freak," he added. "I do what I do to stay alive and to be as able as possible to help others. Plus, it makes for a much better quality of life."

NIH Communicators Take Part in Genome Science Writers' Seminar

By Maggie McGuire

NHGRI director Dr. Francis Collins speaks with nationally syndicated columnist Judy Foreman at a recent seminar for science writers on genome-wide association studies.

Communications and public affairs staff across NIH spend a good amount of their work days writing about and explaining the health impact of the latest genetic discoveries to journalists who cover biomedical research. The hottest new field of genetic research—called genome-wide association studies, or GWAS—is presenting complex challenges to public affairs professionals and journalists, alike. Instead of searching for a single gene that causes an inherited illness—the kind of genetic research that has dominated for decades—GWAS promise to pour out a flood of newly discovered genetic contributions for common diseases. Already in the last few months numerous new genes for diabetes, heart disease, obesity and mental illness have been discovered with this approach.

Accurately reporting these new findings is difficult because the field speaks in a strange language—from SNPs (pronounced "snips," which stands for single nucleotide polymorphisms) to linkage disequilibrium—and relies on challenging statistical concepts and hard-to-interpret results. With a flood of new studies in the offing, including one released in the first week of May on diabetes in *Science* magazine from the intramural laboratory of Dr. Francis Collins, director of the National Human Genome Research Institute, institute leadership decided to use the impending news as a hook to gather and educate leading science and health reporters, as well as NIH communications staff at an impromptu seminar on the subject.

To move quickly, NHGRI's communications office gathered a panel of experts and issued invitations to reporters who closely cover medical research, giving them only a few days notice about the timely seminar. One reporter later said NHGRI had such a good turnout because the journalists didn't have time to be distracted by other stories, given that results from GWAS seemed to be falling from the air lately.

Moreover, in addition to inviting reporters, NHGRI invited all 27 IC communications offices to send science writers or other representatives; some two dozen attended. Since many institutes are now funding GWAS, NHGRI leadership wanted to give the writers of future press releases the background needed to describe these complex findings accurately.

"This is a critical time in the development of this field," Collins said. "There is a great chance for misinterpretation, so we decided to offer writers a head start to understanding the science."

NHGRI held the daylong seminar at a downtown hotel in Washington, D.C. In addition to NIH communications staff, reporters from a variety of media attended, including newspapers such as the *Washington Post* and *Boston Globe*; wire services such as Reuters; major magazines such as *Newsweek*, *Forbes, Science* and *Scientific American*; and broadcasters such as ABC News, CNN and National Public Radio. The seminar itself produced numerous stories, including one on a newly discovered dog gene, a variation of which correlates with great speed in racing whippets.

ROBOTS

CONTINUED FROM PAGE 1

system disorders," he said. What will be "truly spectacular," is the ability to restore lost movement to persons with paralysis, blindness, deafness and even epilepsy.

Donoghue's focus centers on "connecting the brain to the outside world." To do this, researchers began by trying to understand what goes on in the brain when a person moves. Normally, a signal goes from the brain to the nervous system to the muscles to create an action. In people with paralysis, there's a physical disconnection between the brain and the path through the spinal cord to the muscles. "The idea [of this research] is to create a bridge between the brain and the outside world," he said. Researchers plan to use brain signals "to do something meaningful," by connecting to devices such as computers, assistive technologies, artificial limbs or even to the muscles themselves.

***Top**:*
Dr. John Donoghue of Brown University discusses neural interface systems.

***Above**:*
In a photo from Dr. Russell Taylor's presentation, a surgeon at Johns Hopkins controls a "snake robot" using master controllers from a DaVinci surgical robot. He is observing the robot through stereo endoscopic video on a head-mounted display.

One of the most promising technologies is a sensor that's implanted into the brain and detects the electrical activity of neurons that control arm movement. When scientists started this research, they first had to determine whether these signals still existed in people who were paralyzed—from spinal cord injury, stroke or amyotrophic lateral sclerosis (ALS). After watching a patient who had been unable to communicate for 9 years move a dot on a screen with her thoughts, they knew those signals were still intact. "It had a profound impact on what we know about how the brain actually works," Donoghue said.

So far, patients have used this technology in demonstrations to open email, play video games and type letters. In a film Donoghue showed, a paralyzed ALS patient even moved a dot on a screen as his 6-year-old son instructed him. "This just brings out what this technology has the potential to do," he said. "It has a profound effect on these individuals who once had intact lives, enabling them to regain function."

Dr. Geoffrey Ling, a colonel in the U.S. Army Medical Corps and a program manager for the Defense Advanced Research Projects Agency, agrees with Donoghue about this technology's potential—especially its extension into limb prosthetics. Because of the wars in Iraq and Afghanistan, DARPA has focused on the need for prosthetics. "To date there have been 10,397

casualties and 80 percent of them involve the arm or the leg," Ling said. The arm is an especially important focus of research, he explained, as it contains "the most complex biological tool in nature—the human hand."

Because current prosthetics are limited by their dependence on residual muscle and lack of sensory feedback, he said, a "paradigm shift" is being made toward prosthetics with neural control. As in Donoghue's work, these prosthetics utilize brain signals for movement, providing sensory feedback and "enhancing the sense that the prosthesis is truly a replacement limb," Ling said.

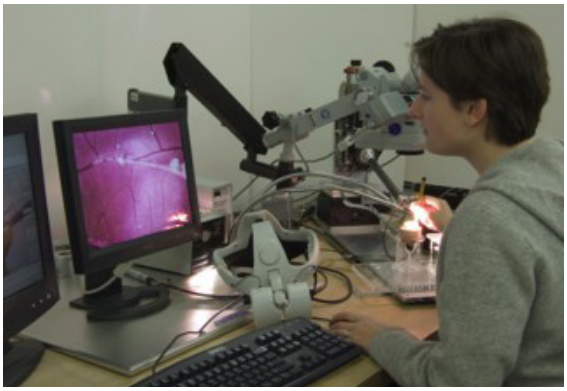
He described two efforts under way to create neural-controlled prosthetic arms, one with a 2-year plan and one due in 4 years. This means that by 2009, a prosthetic arm will be developed that people can move simply by thinking, just as they would a natural limb.

As far as robotics used in medical procedures, Dr. Russell Taylor, a professor and director of the NSF Engineering Research Center for Computer-Integrated Surgical Systems and Technology at Johns Hopkins, provided an overview of computer-integrated interventional medicine. He predicts that partnerships between "clinicians and computer-based technology will fundamentally change the way surgery…is performed in the 21st century in much the same way that computer-based technology changed manufacturing in the 20th century."

New capabilities will provide better outcomes and more cost-effective processes, he said. Researchers are developing a family of surgical systems that "combine innovative algorithms, robotic devices, imaging systems, sensors and human-machine interfaces to work cooperatively with surgeons in the planning and execution of surgical procedures."

He also stressed that a lot of the work he described was done with NIH funding, and that "NIH will be more and more important as this work progresses."

Dr. Michael Marohn, director of the Minimally Invasive Surgery Training Center at Johns Hopkins, furthered this discussion by explaining work being done in natural orifice surgery and pointing out the "digital potential" of converging medical technologies.



In an experimental microsurgery workstation at Johns Hopkins, a "steady hand" robot uses specialized compliant control; both surgeon and robot hold the instrument. A sensor detects force exerted by the surgeon and the robot's controller moves the robot accordingly. Because the robot actually moves the instrument, the motion is tremor-free and can be very precise.

But perhaps the most "sci-fi" of all the areas discussed was medical simulation. Dr. Alan Liu described his work as director of virtual medical environments for the National Capital Area Medical Simulation Center, Uniformed Services University of the Health Sciences. He said that because of current challenges in medical education, and because of the Institute of Medicine report citing the rising rate of deaths due to medical errors, simulation is increasingly seen as a way to improve training and decrease mistakes. At his center, several methods of simulation training are used, including standardized patient examinations (in which actors mimic symptoms of diseases for diagnosis), computer-based "virtual" patients or mannequins and training in a virtual reality lab, where different procedures can be completely simulated.

One especially exciting project under development is a wide-area virtual environment for team training, Liu said. In several large rooms, back-projected walls, loud noises and virtual images will simulate an Iraqi war zone where teams will have to deal with mass casualties. It's still in early stages, but it's another step forward in proving the usefulness of simulation, he explained.

Dr. Elizabeth Hunt, director of the Johns Hopkins Simulation Center, echoed this point, describing the types of simulation used by her students. These include micro simulation, where students use computer programs to practice skills, partial-task simulators, virtual reality, standardized patients (with whom students also practice communication skills), mannequin simulators and hybrid simulators, in which two or more of these types are employed. Hunt brought with her a simulated mannequin "baby" that squirmed just a like a real, tiny patient; this was just one of several demonstrations of robotic wizardry held after the talks.

Despite the futuristic research on display, however, all of the researchers emphasized that the underlying idea is a very practical one. "The real bottom line is patient care," said Taylor, "and to provide new capabilities that transcend human limitations."

ORWH Seminar Examines Health of Adolescent Girls

Welcoming speakers and attendees to the recent seminar "The Health of Girls and Women Across the Lifespan: Adolescents" held in Lipsett Amphitheater, Dr. Vivian Pinn, director of NIH's Office of Research on Women's Health, emphasized the importance of discussing the dramatic developmental and physical changes that occur in young women throughout adolescence that create unique vulnerabilities for social, emotional and intellectual functioning.

Problems with adolescent substance abuse are a major concern for health care providers and families. "Drug abuse and drug addiction hit peak levels in adolescence and can be classified as a brain development disorder," said Dr. Donald Vereen of NIDA in his presentation on addiction and adolescents. "The peak for use of tobacco, marijuana and alcohol is prior to age 20," he warned. This has serious health consequences since drug abuse can impede the brain's developing and molding/repair areas leading to significant toxic changes in the brain.

Dr. Ronald Dahl of the University of Pittsburgh presented work on sleep behaviors in adolescents and described how sleep is "a perfect model of an adolescent health paradox." While the body's physical need for sleep is increasing rapidly during this time, the social and psychological environment of an adolescent creates the desire for risk-taking, sensation-seeking and intense sexual and romantic feelings. This combination of lack of sleep during a time when more sleep is needed for cognitive and social development evolves into a negative spiral of tiredness, lack of attention, decline in learning, negativity and increased use of caffeine and other stimulants.

Both Dr. Russell Pate of the University of South Carolina and Dr. Dianna Neumark-Sztainer of the University of Minnesota focused on the need for healthier lifestyles that include increased physical activity in children and youth. Pate emphasized the need to encourage girls in middle school to develop and master new physical skills that can lead to a lifetime of consistent, healthy activity. Neumark-Sztainer spoke about the eating trends of adolescents who "functioning in a thin-oriented society need to avoid unhealthy dieting behavior and stress more activity and healthier lifestyles. Unhealthy dieting can lead to a triple stigmatization involving race, lower socio-economic status and obesity," she said.

Dr. Christine Bachrach of NICHD presented an update on the National Longitudinal Study of Adolescent Health (ADD Health Research Project), a study covering a broad spectrum of racial and ethnic diversity. Some findings highlighted that peer relationships among adolescents can have positive influences on adolescents in school. Researchers also saw a link between obesity and school performance; after high school the more obese were less likely to enter college. The next wave of studies will examine the roles of behavior in pre-disease pathways.—**Marsha Love**

***Right**:*
Engineer Gary Cooper shows off the green roof to the audience, which includes visitors from other federal agencies. A green roof is a "reverse roof," so waterproof materials go on the bottom.

***Below**:*
Environmental compliance officer Capt. Ed Pfister originally came up with the idea to meet stormwater requirements with a vegetated roof.

***Bottom**:*
Drainage points for stormwater overflow are precisely positioned. The 0.6-acre green roof accounts for 27 percent of runoff in a 9-acre space.

ROOF

CONTINUED FROM PAGE 1

they are clear," said Shah Saleh, project officer with the Office of Research Facilities Development and Operations (ORFDO) for the Gateway Center project, whose green roof helps prevent flooding while cleaning and cooling the runoff.

"This also helps protect flora and fauna," he said. "It saves birds." In addition, it provides the building with added insulation and beauty.

At a recent presentation in the Natcher Bldg., Saleh showed the audience how this sustainable feature works. With acknowledgments to his "right-hand man," Gary Cooper, as well as to Capt. Edward Pfister of ORFDO's Division of Environmental Protection, Saleh made his case.

Conventional roofs are hot and the steamy runoff is no friend to fish. A green roof resembles a basin filled with a medium that absorbs precipitation like a sponge. It then modulates the water temperature and keeps the water banked within, pending a cooler, cleaner, controlled release.

"Here's the philosophy," said Saleh. "Montgomery County has over 300,000 acres of undeveloped space—over 50 percent is still open farm land. But humans need highways, commercial areas, residences. These impervious areas are really against Mother Nature."

"Water-impervious"—impenetrable—areas include roads, parking lots, driveways, sidewalks and rooftops. These surfaces interrupt the hydrologic cycle—that is, they alter how water naturally acts on Earth's surface, in the soil and atmosphere. Uncontrolled runoff erodes the land and degrades the structure of streams and rivers while polluting the water itself. Since changes in the watershed are cumulative, fish and wildlife suffer—and they are not alone.

"Even in clay, certain plants can grow," said Saleh. "When there is heavy precipitation, water is stopped or slowed by plants. Once we strip land, we have impervious surfaces. As the water then rapidly gains momentum, floods can ensue."

Engineer Cooper offered details to the audience, which included visitors from other federal agencies. A green roof is a "reverse roof," he explained, which means the waterproof materials go on the bottom: first, a leak-proof layer that's "asphaltic," or tarry, topped with paper and a water retention barrier, a dimpled, geotechnical fabric. These materials protect the building structure. Drainage points for overflow are precisely positioned "because we don't want water to be trapped forever."

Atop that is a lightweight soil medium, such as "expanded coal or slag, shot with air, so it's porous, like pumice," said Cooper. "It holds a lot of water for the size of it. We put down a 4-inch layer, incorporated with mushroom mulch in a mix of 70 slag to 30 mulch." This medium is very important, he noted, since it acts as an insulator and a barrier to absorb moisture. Result: "The plants are able to sustain themselves in hostile environments."

The audience had questions: Would the roots get long enough to pass through the roof? No, said Cooper. They will get "root mat, which will make the roof very strong." What if we get 2 feet of snow? "It's very conservatively built," said Saleh. What of maintenance? "Yes, we must weed now," Saleh explained, but once the

plants mature they should spread to fill the space and become almost maintenance-free.

And whose idea was this in the first place? It was Pfister, one of NIH's environmental compliance officers, who came up with the idea to offset stormwater requirements with a vegetated roof. The Gateway Center design team was looking for ways to meet stormwater regulations and also comply with sustainability initiatives. The green roof was a welcome concept.

Pfister explained that, according to HHS initiatives on sustainability, new construction must optimize energy performance, protect and conserve water and reduce environmental impact. Additionally, NIH must account to the state of Maryland for "the previously pervious area"—in this case, where pine trees once stood. "We have had to find space to collect water and runoff in a very small space," he said. There was no room for stormwater ponds.

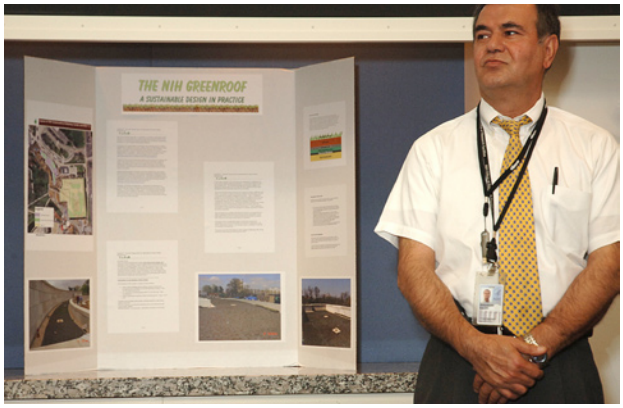
Of the 140,000-square-foot Gateway Center project, approximately 100,000-square-feet (2.29 acres) is new impervious surface. The green roof accounted for 27 percent (0.61 acres) of the stormwater runoff from the project site. The state then allowed NIH to "bank" the remaining stormwater debit under the NIH Master Stormwater Management Plan, Pfister said. This "debt" is to be repaid by future site improvements such as removal of parking lots or construction of the Stoney Creek Pond south of the National Library of Medicine.

The talks were followed by a field trip to the roof itself. The Gateway Center is set into a hillside, so as folks were led to the back of the building, they were standing level with the roof. The fresh plantings looked tidy, if modest, in their grids: "They will fill in," Cooper promised. The soil medium seemed like gravel, but each nugget was lightweight and pocked like a tiny moon.

"This is the first green roof in Montgomery County," said Saleh. "It really is a show-off."

Yes, it is more expensive than a conventional roof—about 40 percent more—but otherwise, 300-foot drainage tubes would have to have been installed underground, and that would not have been cheap since, as he pointed out, "You're standing on solid rock."

The green roof, in the long run, helps the bottom line. "And," said Saleh, "it helps Mother Nature."



***Left**:*
Project Officer Shah Saleh explains the multi-purpose benefits of the green roof.

***Below**:*
Fresh plantings of succulents, set out in grids, will soon fill in. Once they reach mature size, these hardy specimens need little maintenance.

PHOTOS: MIKE SPENCER

Some Green Roof Basics

Green roof applications are appropriate for residential, farm, industrial and office buildings. Depending on latitude, expected snow and rain load and building construction, additional reinforcement may or may not be necessary. Typically, a green roof consists of a thin layer of soil (2-3 inches) and a drainage layer, applied directly to a roofing membrane. For sloped roofs, baffles may be necessary to retain the soil.

Green roof plants are typically short perennials and succulents, including varieties of Sedum or Delosperma. These plants will quickly cover the soil and prevent erosion, retain rainwater and provide insulation and respirative cooling.

To summarize the benefits of green roofs:

- They are esthetically pleasing
- They act as a retention pond with calculated slow-release discharge
- They filter water by removing dust, grit and other impurities
- They cool the water before it releases into streams
- They help flora and fauna
- Once plants reach mature size, they require minimal maintenance.

CYCLIST

CONTINUED FROM PAGE 1

The soft-spoken Ph.D. has been racing bicycles since he was a teenager in San Francisco, but only lately has come into his own as an event winner.

"I must be figuring something out," he said.

What amazes his NIH cycling peers, with whom Mittelstadt trains during noon-hour rides from campus to Potomac and back, is how well he does for a person who doesn't ride professionally.

At the Maryland championships, "He beat a substantial field of extremely competitive local riders, most of whom practice an average of more than 250 miles a week at extremely intense levels," said Dr. Ad Bax, an NIDDK spectroscopist who has also been successful as a rower and runner.

Top:
Mittelstadt competes in a recent road race; he has been remarkably successful since turning age 50.

Above:
Though relaxing here at the Bldg. 40 outdoor cafe, Mittelstadt rides during his lunch hour most days at NIH.

A staff scientist in NCI's Laboratory of Immune Cell Biology, Mittelstadt, 50, only averages 10 hours a week training, chiefly the lunchtime 25-milers with fellow NIH'ers (who on July 12 were joined by D.C. Mayor Adrian Fenty, whose brother belongs to DC Velo, Mittelstadt's local club) and a Saturday morning 35-miler out Clara Barton Parkway, which he knocks out in less than 2 hours.

He hasn't a clue of what his state-title-winning time was in Smithsburg, noting only that he won by "a bike length."

Though he admits that many of his fellow racers profit from weightlifting sessions and hours of work aboard stationary bikes, Mittelstadt has little use for either. "I have some dumbbells at home that I use occasionally. And my teammates all use a stationary bike, but I don't." Too boring, he says.

His secret training weapon is "trying to keep up with the young local riders—that's always a challenge."

Born in Florida but reared in San Francisco, Mittelstadt had some success as a "junior" rider. While in his early twenties, he was a district

champ in Northern California ("But California is a big state," he qualifies, humbly), specializing in the 1-kilometer time trial and match sprints, which are head-to-head races against one other rider.

Competing off and on as an adult, he once viewed age 40 as the ceiling of his cycling career. "Then when I reached 40, I thought 50 was too ridiculous." Though he didn't perform especially well at the USA Cycling National Festival at Seven Springs, Pa., in early July (he placed 44th in his age group), he noticed that the field "was pretty large" for men 60+ and 70+, and thus plans to race indefinitely.

Today he is sponsored by the energy-trading company Clean Currents and by Don Beyer Volvo, which pay his race-entry fees and other nominal expenses. When Mittelstadt wins a race and earns a cash prize, the money goes toward supporting the promising younger riders at DC Velo. He enters fewer than 20 contests a year, choosing some simply because of the beautiful terrain, as in September's Green Mountain Race in Vermont, which he terms "a spectacular course.

"It's kind of an addicting thing that we do," he says of racing. "It's better than some other addictions."

A 10-year NIH veteran who converted to a staff scientist position after completing postdoctoral work here, Mittelstadt studies T cells and how they activate proteins involved in carcinogenesis. Naturally, he bikes the 1.5 miles to work each day, and wishes more NIH'ers would form the habit, although he concedes that he's broken three bike frames on the way to work, and once rammed a motorized wheelchair by accident, leaving the occupant uninjured but totaling his bike.

Luckily, the bike wasn't his Orbea, a Spanish-made 18-speed that cost somewhere north of $4,000.

"Something's always going to get you if you're not paying attention," he chuckles. He has bro-

ken his wrist, collarbone and pelvis, which required surgical reconstruction, but is heartened by the fact that fellow riders with artificial knees and replaced hips have done remarkably well in bike racing.

"That's the thing about cycling—if you have some sort of orthopedic problem, it's usually not made any worse by biking."

As you might expect for a scientist, Mittelstadt says, "I sort of know how many calories a ride consumes" (about 2,200 during a 50-mile race) and, like many riders, has a power meter on his handlebar that measures his energy output in watts. Cruising along the flat sections at his average pace of 23 m.p.h. in the Smithsburg race probably cost him 250 watts, 600 on the "bumps" (biker lingo for hills) and maybe over 1,000 for the final sprint.

The scientific mind is also an advantage in planning race strategy: "We're always looking for technical challenges, things that will separate the pack. You need things to break up the bunching. Hills are the best thing, side winds are another. Also aggressive riding."

Mittelstadt likes to "go out fast, and manipulate whoever I'm with into doing more work," which can be accomplished by tactics such as drafting behind a racer, then overtaking him in a sprint.

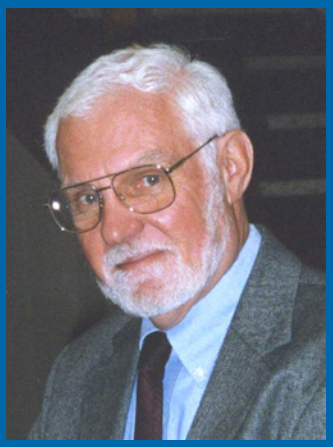
Though encouraged by his recent string of victories, Mittelstadt, who only won one 40+ event last year, seems disinclined to attribute his success to any personal virtue. "I think I'm winning because I've gotten over my allergies—the tree pollen this spring was especially bad. And being 50 years old in a 50-60-year-old group is probably the biggest factor. The downward curve may be getting steeper in this age range. In a couple of years I'll start drifting to the back of the pack."

And lest you think he's above such common activities as parking in front of the television set, he admits to enjoying Tour de France coverage on TV. "I Tivo the race every day and watch it at night after work."

See? Human after all.

NLM Communications Chief Mehnert Retires

By Claudia Quiros



Bob Mehnert, director of the National Library of Medicine's Office of Communications and Public Liaison, retired last month after more than 43 years of federal service. In a career that has roughly paralleled the computer age, the Buffalo native applied his editorial and literary talents to the rise of mainframes, the Internet and podcasts. He promoted and shared the breadth of knowledge contained in NLM's print and electronic holdings with what has become a global user group.

A graduate of the University of Buffalo, he came to NLM in 1965 and, after a stint in publishing, returned in 1971 to become public information officer. He has managed the press office of the largest medical library in the world ever since.

Among many achievements, Mehnert helped launch MedlinePlus.gov in 1998. Today, the site is renowned worldwide by physicians and medical experts as a reliable source of consumer-friendly health information. He also led publicity efforts on behalf of ClinicalTrials.gov, NIHSeniorHealth.gov, Genetics Home Reference and the Household Products Database, rich online resources that reflect the library's trend of disseminating the biomedical knowledge of the world, not only to medical professionals but also to the public.

As demonstrated by the fruits of his career, Mehnert's primary service is to people. By keeping NLM in the news, he kept the public in the know, spreading information as quickly as research breakthroughs and new databases became available. Most recently, working with an editorial team at NLM and contributors throughout NIH, he helped produce the new quarterly magazine *NIH Medline*Plus to give people health care news they can use in their daily lives.

Though honored with the NIH Director's Award and the NLM Director's Award, among other distinctions, Mehnert received perhaps the greatest compliments from colleagues who hailed him as a talented wordsmith, the professional's professional and someone who takes the work, but not himself, seriously. He was also one of the NIH Blood Bank's most loyal donors, contributing some 185 pints through the years.

A family man first, Mehnert relishes spending time with his three daughters and seven grandchildren. He and his wife, Helene, also have one great grandchild and a second on the way. On family outings to Duck, N.C., each summer, Mehnert has long enjoyed fishing and sailing—hobbies he will continue in the coming years.

digest

Hearing Two Things at Once

The fact that you can simultaneously listen to someone talking on the phone and someone talking on the radio says more about your genes than about what a great listener you are. According to new research from NIDCD's study of identical and fraternal twins published in the August issue of *Human Genetics*, skills in "auditory processing"—the functions performed by the brain that help a listener interpret sounds—are largely hereditary. Auditory processing skills allow us to, among other things, determine where a sound is coming from, the timing and sequence of sounds and whether a voice we hear is one to pay attention to or ignore. In the majority of tests for these skills, researchers found a significantly higher correlation among identical twins than among fraternal twins, indicating that the differences in performance were largely genetically, well, related.

The ability to listen to two people at once has been found to be hereditary, according to an NIDCD study of twins.

The Earlier Treatment the Better

Initial results from an ongoing clinical trial sponsored by NIAID suggest that more HIV-infected infants survive if they are given therapy early on, regardless of their apparent state of health. The findings—presented in July at the 2007 International AIDS Society Conference in Sydney, Australia—could have significant public health implications, researchers said, because they will lead experts to consider changes in standards of care in many parts of the world and because they highlight the importance of diagnosing HIV infections early. An estimated 2.3 million children are currently infected with HIV; there were more than half a million born with the virus in 2006 alone.

New Insights into HIV Vulnerability

More news from NIAID: thanks to the first genome-wide association study of an infectious disease, conducted through the Center for HIV/AIDS Vaccine Immunology that was established by NIAID in 2005, we now have a clearer picture of why some people can suppress virus levels following HIV infection. Investigators identified three gene variants, two of which are linked to an infected person's ability to control HIV viral load and a third that's implicated in disease progression to AIDS. Published by *Science* on the Science Express web site, this research could help provide new targets for vaccine developers and could lead to improved HIV therapies.

Speedier Relief for Depression

NIMH researchers have learned more about how the medication ketamine—used experimentally for depression—relieves symptoms of the disorder in hours, rather than the weeks or months it takes for current antidepressants to work. The research, published online in *Biological Psychiatry*, impacts more on the use of antidepressants in general than on ketamine itself; its side effects make it unlikely to ever come into use. Instead, learning how ketamine works so quickly should aid in getting scientists closer to understanding how to develop faster-acting antidepressant medications for those who suffer from the disorder, thereby eliminating the great lengths of time current sufferers often have to wait to see if they will find relief.

Soda and the Heart

Drinking more than one soft drink daily, be it diet or regular, gives middle-aged adults a more than 40 percent greater rate of having or developing metabolic syndrome, a cluster of conditions that increase the risk for heart disease. The new data from NHLBI's Framingham Heart Study, published in a report online in *Circulation*, echoes earlier findings showing that extra calories and sugar in soft drinks contribute to weight gain and therefore to risk for heart disease. However, the similar risk found among those drinking diet soft drinks is more challenging to understand, researchers said, adding that a possible explanation might be that people who regularly drink soft drinks, diet or not, are also known to eat foods higher in calories and fat and get less physical activity.—**compiled by Sarah Schmelling**

volunteers

The phone numbers for further information about the studies below are 1-866-444-2214 (TTY 1-866-411-1010) unless otherwise noted.

ADHD Genetics Study

Take part in an NIH study seeking to identify the genes that contribute to ADHD (attention deficit hyperactivity disorder).

Muscular Leg Pain?

If it is caused by blocked arteries and it occurs with activity but improves with rest, call NIH for more information on a new study.

Have Enlarged Gums?

Do you have enlarged gums and are you taking dilantin, cyclosporine or calcium channel-blockers? Take part in an NIH study.

HIV+ Volunteers Needed

HIV+ volunteers off anti-HIV medications, CD4+ count 300 or greater, needed for research study at NIH. Compensation is provided.

Adults with Neurofibromatosis

Adults with neurofibromatosis type 1 are asked to consider participating in NIH studies. All study-related tests are provided at no cost.

Do You Have Ankylosing Spondylitis?

Consider volunteering for an NIH research study. Compensation is provided.

Stopping Your Estrogen Therapy?

NIMH is investigating whether mood, anxiety and irritability occur when you stop taking your estrogen or estrogen/progesterone combination therapy. Participants should be ages 45-60, be currently taking ET or combination therapy and plan to discontinue it and be in good physical health. For information call Linda Simpson-St. Clair, (301) 496-9576 (TTY 1-866-411-1010).

Neck Pain Study Needs Volunteers

Are you a healthy individual with or without neck pain? If you are between the ages of 18 and 65, you may be eligible to participate in an NIH neck pain study and receive a comprehensive cervical musculoskeletal examination without compensation. This is a 3-month natural history study, not a treatment study. For more information, email: neckpainstudy@gmail.com or call (301) 496-4733. Refer to study 02-CC-0245.

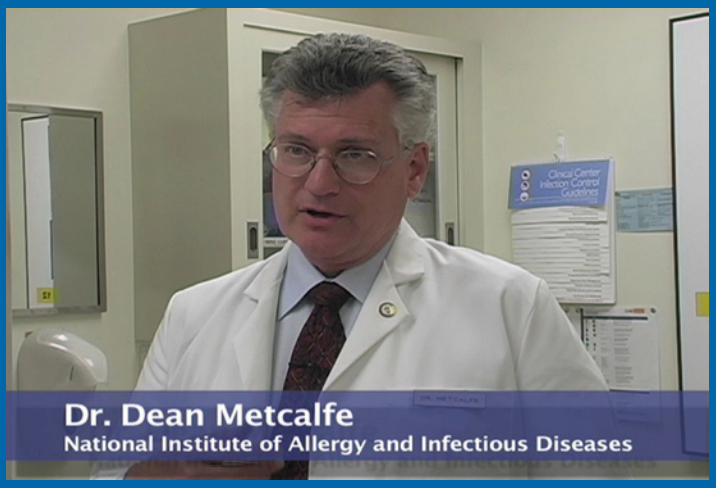
Aishu Iyer (l) and Anna Purtscher examine a molecular model made from gum drops and toothpicks.

Program Offers Science Adventure for Children

Adventure in Science, a nonprofit science education program for children, is planning its 15th year at NIH. The program, which meets on Saturday mornings October through March in Bldg. 10, is designed to show 8-11 year-olds the fun of science using hands-on activities, from building (and launching) model rockets to dissecting frogs. The teachers are mostly NIH volunteers, from postdoc to institute director.

If you are interested in volunteering to teach, contact Peter Kellman, (301) 496-2513 (peter.kellman@nih.hhs.gov) or Ed Max, (301) 827-1806 (edward.max@fda.hhs.gov). To enroll a child, request forms from the 4H office at Montgomery County Cooperative Extension, (301) 590-9638.

Tarun Shah removes bones from an owl pellet to identify what animals the owl ate.



Adding Video to the Mix

NIH Offers Monthly Vodcasts

By Lauren Waddell

NIH has always been at the forefront of medical research and technology. That message has consistently been conveyed through print, television and radio. Now, as media technology continues to grow, NIH is making a point to keep up with the ever-developing information age.

Recently, the NIH Office of Communications and Public Liaison began adding a monthly vodcast to its repertoire of media outlets used to share research developments and discoveries. Vodcasting is a digital recording similar to the downloadable sound files of a podcast. Besides sound, however, vodcasts add video to the mix, creating a rich visual experience for the user.

"A driving force behind the decision to start the vodcast came from both the News Media Branch's experience and success with the audio podcast, and the realization that more and more information over the Internet is communicated with video as well as audio, images and text," said John Burklow, NIH associate director for communications and public liaison.

Vodcasts can be downloaded and saved from the Internet to a computer or personal media device such as a video iPod. This makes it possible for users to be in control of the time and manner in which they choose to watch the vodcast.

The first NIH vodcast was produced and aired online in April. Since then, the vodcasts have become monthly productions.

"There are a lot of benefits to having a monthly vodcast," said Calvin Jackson, chief of the OCPL News Media Branch. "One is that video and the format of 'i on NIH' allow a very dynamic way to tell stories, share news and bring information to the public. A great advantage of a vodcast over other media is that it is both visual and easily accessible all over the world via the Internet."

The vodcasts typically contain three main segments and last about 20-30 minutes. Episodes have included the Discovery Channel's Young Scientist Challenge, coverage from the NHLBI Heart Truth's Red Dress Project and Fashion Show, the HBO documentary series *Addiction*, HIV Vaccine Awareness Day and the "Be the Generation" HIV vaccine education initiative and staying safe under the summer sun. Each episode includes an in-depth interview with an NIH researcher and briefs from *NIH News in Health* and *Research Matters*.

"I'm sure the viewership of 'i on NIH' will grow," said Joseph Balintfy, OCPL public affairs specialist. "We're getting better at producing each episode and keep finding more and more interesting topics to report on from all corners of medical research and NIH."

Viewers can subscribe to the vodcast at www.nih.gov/news/vodcast/nihvodcast.htm or watch the program on their computer via a direct link. NIH will soon also have a major presence on YouTube with a dedicated medical/science channel.

***Above**:*
The monthly "i on NIH" vodcast features Internet-accessible health information, including the latest research on eye health and allergy management.